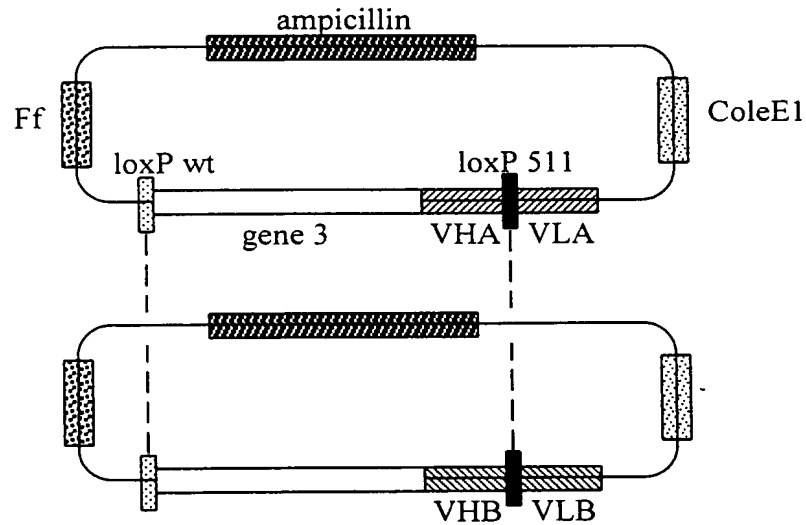


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Before recombination



After recombination

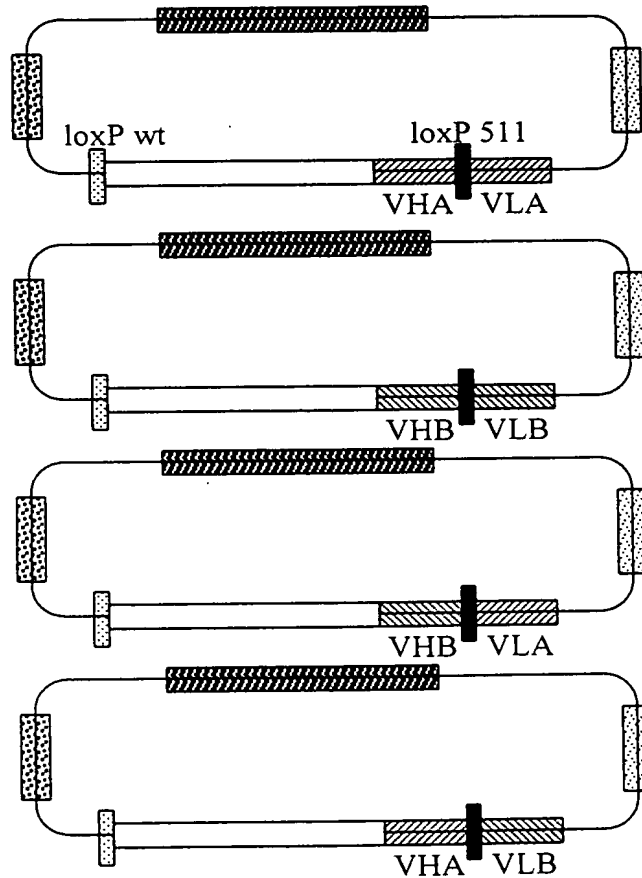


Fig. 1 All phagemids, before and after recombination, have functional antibodies

S G G S T I T S Y N V Y Y T K L S S S G T
TCCGGAGGTCGACC ATAACTTCGTATAATGTATACGAAAGTTAT CCTCGAGCGGTACC
 BspEI Sali lox511 XhoI KpnI

Fig. 2

AAGCTTGCCAAATCTATTCAAGGAGACAGTCATA
ATGAAATACCTATTGCCTACGGCAGCGCTGGATTGTTATTACTCGCAGCAAGCGGCGCATGCC
 HindIII Shine Delgano
 BssHII

bacterial leader
 M K Y L L P T A A A G L L L A A S G A H A

S G G S T I T S Y N V Y Y T K L S S S G T
 ...VL chain...TCCGGAGGTCGACC ATAACTTCGTATAATGTATACGAAAGTTAT CCTCGAGCGGTACC....VH chain....
 BspEI Sali loxP 511 site XhoI KpnI

SV5 epitope tag His6
 A S G K P I P N P L L G L D S T H H H H H (Q)
GCTAGC GGCAAACCAATCCCAACCCACTGCTGGGCCTGGAT AGTACT CACCATCACCATCACCAT TAG
 NheI ScaI amber

gene 3' protein
 A A A T V E S C . . . R N K E S stop
CGGCGCCG TACTGTTGAAAGTTGT.....CGTAATAAGGAGTCT TAA GCATGC ATAACTTCGTATAATGTATACGAAAGTTAT
GAATTC
 NotI
 EcoRI

loxP site

Fig. 3

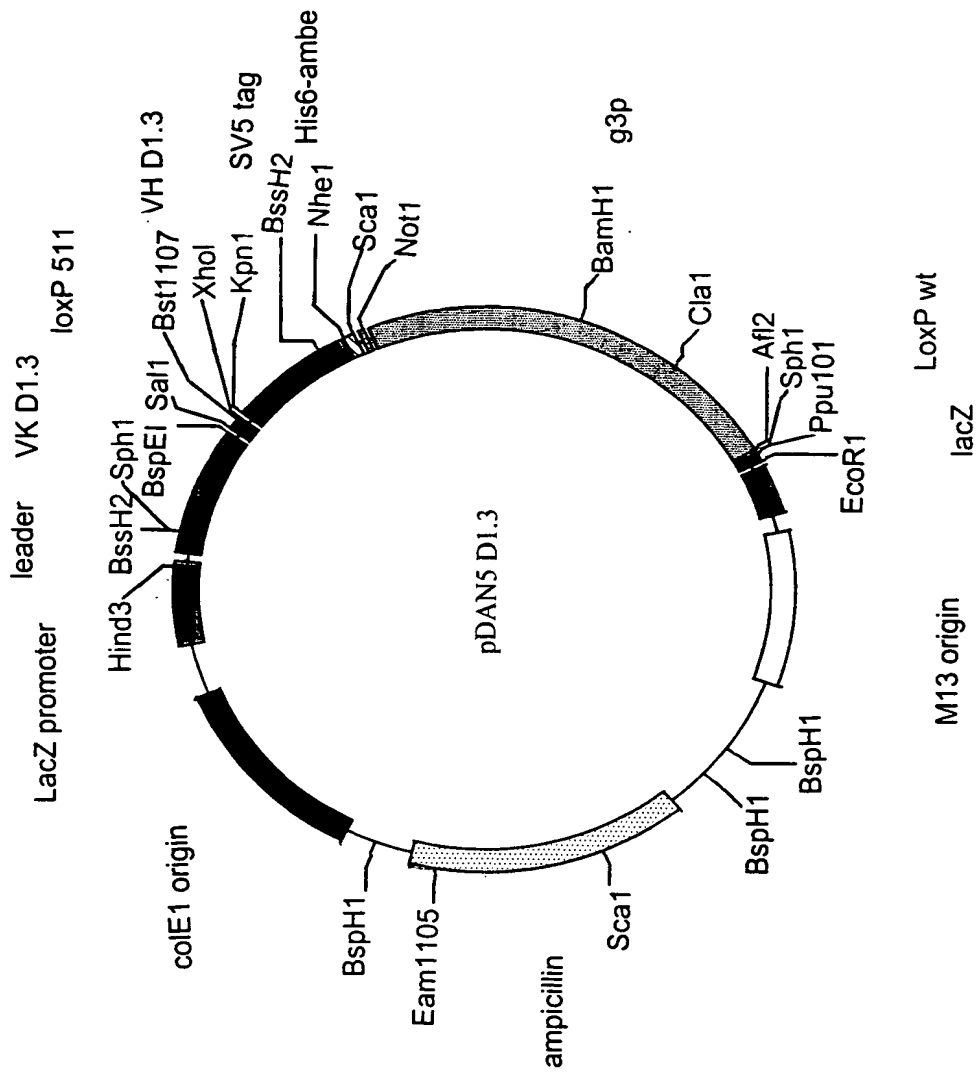


Fig. 4

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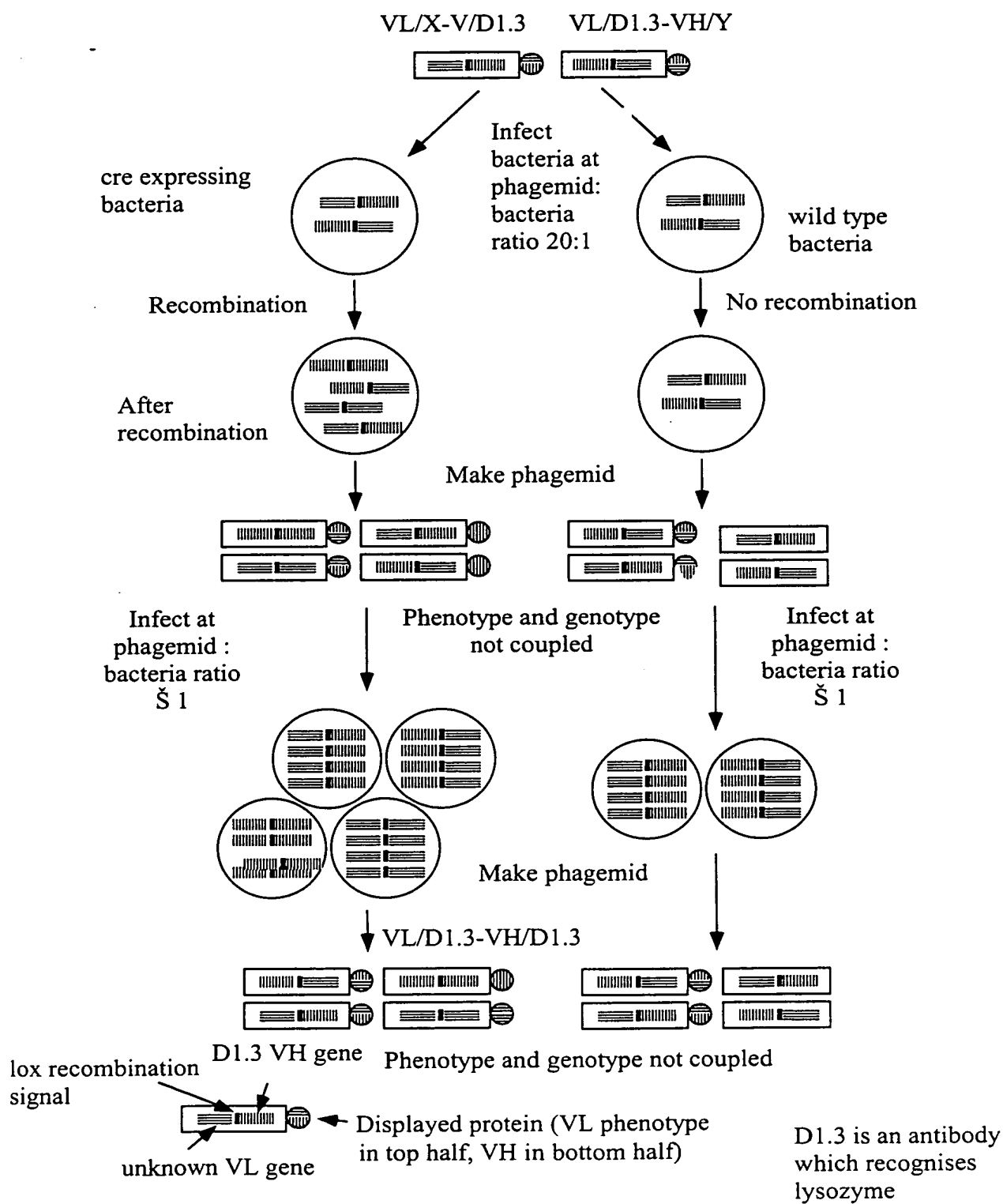


Fig.5

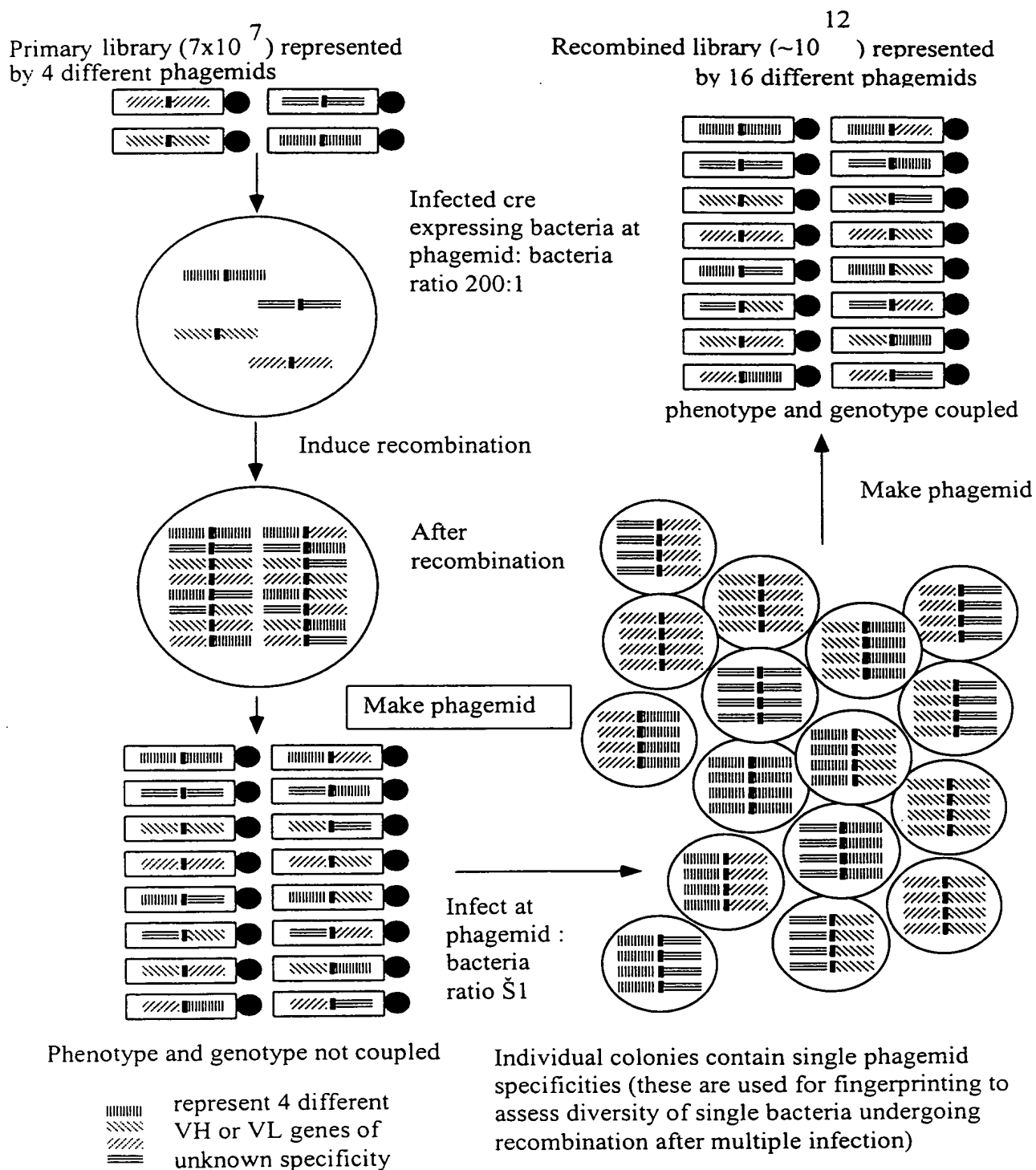


Fig. 6

VH																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1							1									
2								1									
3			1														
4				1							1						
5					1												
6											1						
7												1					
8														1			
9	2	2															
10	3		1						1								
11	2	1			1			1									
12	2		1		1	1	1				2					1	3

Fig. 7

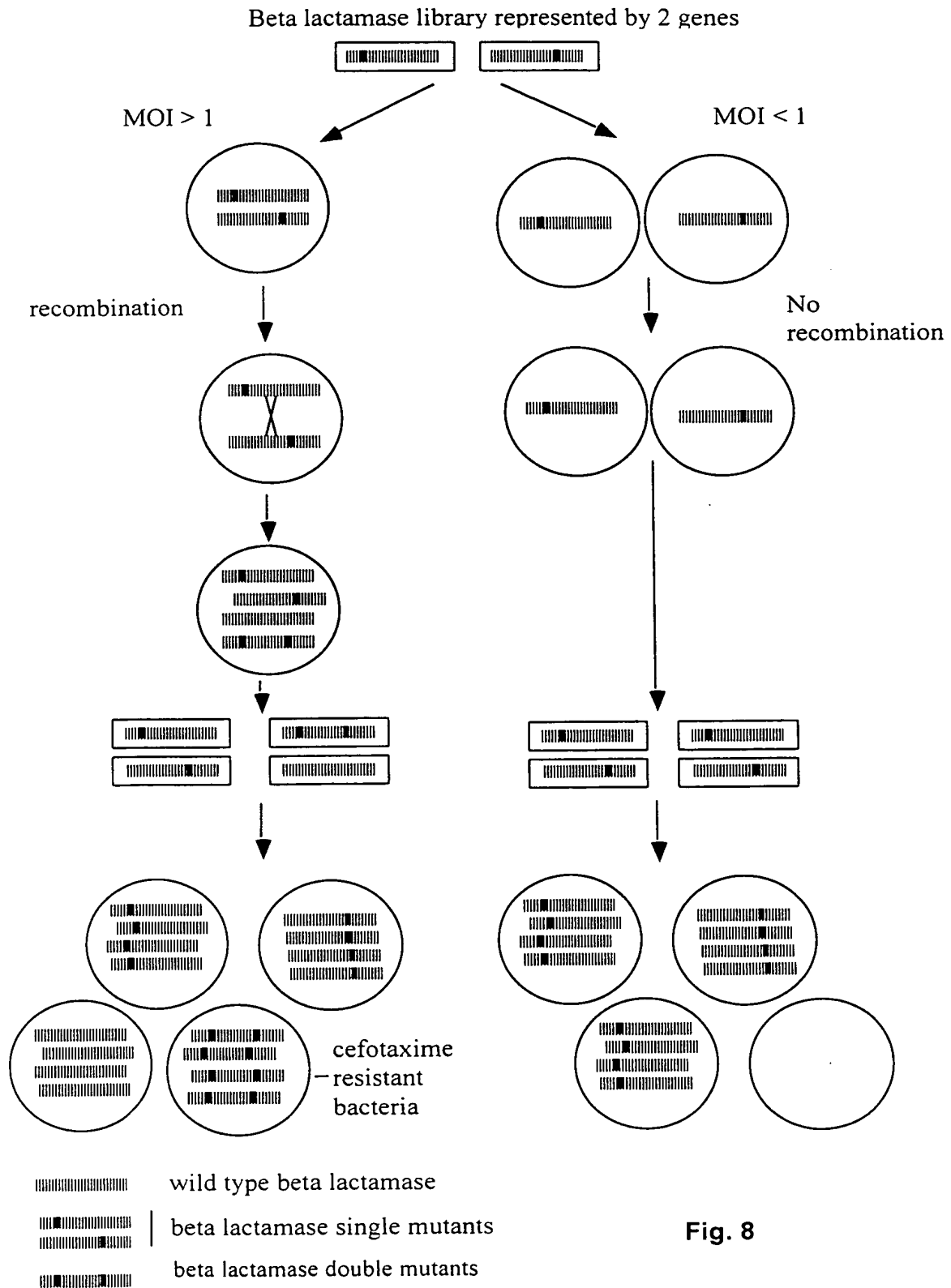


Fig. 8

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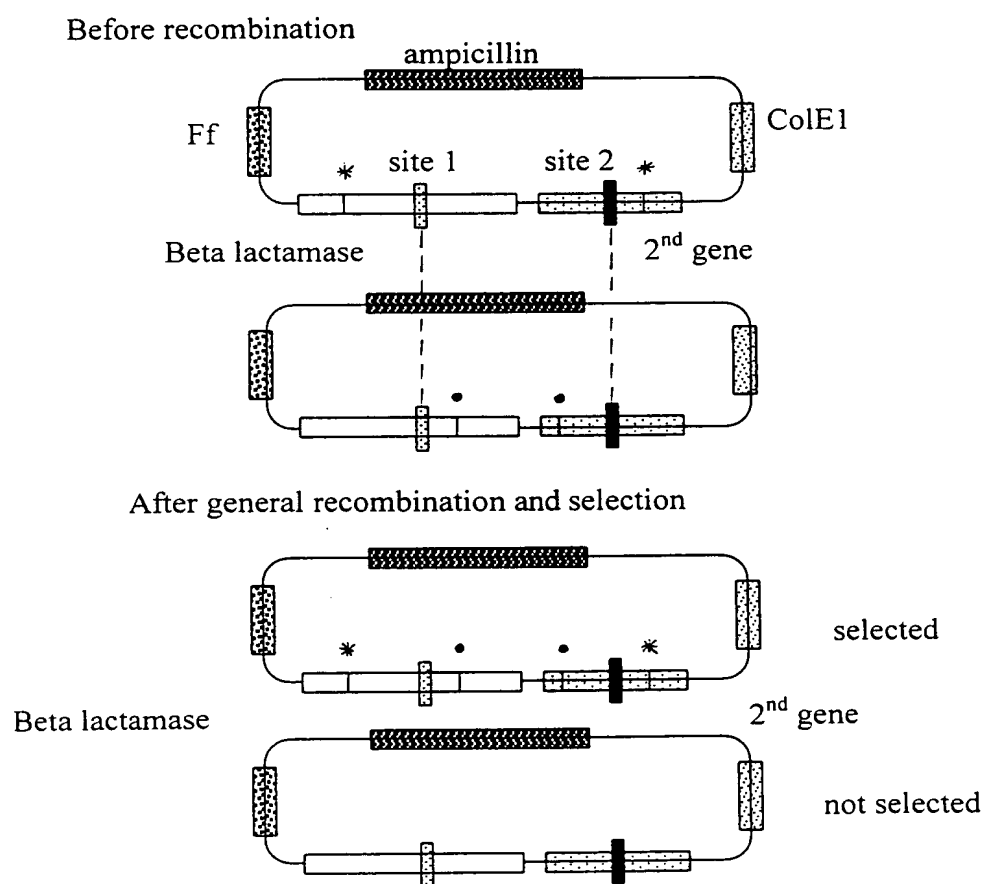


Fig. 9